

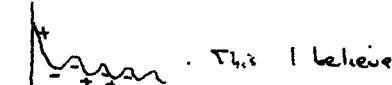
CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA

DIVISION OF BIOLOGY
KERCKHOFF LABORATORIES OF BIOLOGY

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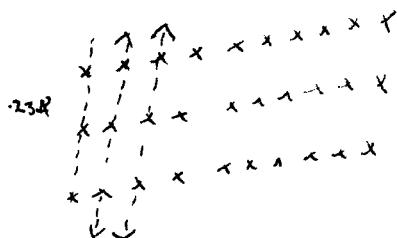
Dear Rosalind

Thanks very much for your latest manuscript. For the past several weeks I have been on the East Coast and so out of touch with TMV. Dan Caspary had told me that he would write you, hence the reason I didn't. However upon my return, I find that he hasn't and so I'll communicate his later returns.

His sign combination is +---+-+, starting at the origin. 

is quite different from your choice. It gives a sharp peak at 23 Å (which we believe are the phosphates) and a shorter peak around 45 Å. It terminates at 85 Å and is almost zero from 0 Å to 15 Å which we believe is a hole filled with water. He furthermore has a ^{Difference} Fourier (using the same sign combination) from his Pb^{++} substituted TMV. He finds that 2 Pb^{++} atoms per sub unit (30,000) combine (more cause the TMV is precipitated) specifically with the TMV, one at a radius of 25 Å, the other at 82 Å. The peaks are very sharp, which he believes is a good indication that the sign assignment is correct.

For the RNA core we favor a 10-12 stranded model in which the RNA chains follow the same helical path as the protein - This seems necessary from the perfection of the TMV cleft.



We like this model since the Coker & Stanley RNA appears to have a molecular weight approximately $\frac{1}{10}$ that of the 2.5×10^6 core. Under this picture the TMV length of 3000 Å would be determined by the

length of the RNA. The problem then becomes to assign a structure to the RNA strands. They must have a slow twist and take up essentially a ribbon configuration. To fit these requirement I have constructed a double stranded ribbon in which the two strands are linked together by pyrophosphate bonds between the phosphates. However it is all very speculative. Fortunately, a chemical test is possible and this we are doing. The main think in favor of the P-OP model is that it is very very pretty ~~and~~ stereochemically. But does nature always like to be pretty?

I have made an application to the National Science Foundation for a grant to allow me to be in England next year. If it comes through I shall be back in Cambridge by the first of July. Just recently I have received an offer from Harvard (Asst. Professor in Biology) and its most likely that I'll accept. Fortunately they are being very nice and allow me leave of absence for the initial year. Hence in my particularity, I'll be leaving Caltech in the middle of June.

Hope to see you soon. I'll try to get Dan to write you some details.

Jim